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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DANTE J. PACELLA, NORMAN RICHARD SOLIS, and
HAROLD JASON SCHILLER

Appeal 2016-004869
Application 12/624,667¹
Technology Center 2400

Before CARLA M. KRIVAK, JOSEPH P. LENTIVECH, and
JOHN R. KENNY, *Administrative Patent Judges*.

LENTIVECH, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's final rejection of claims 1–5, 7–18, and 20–22. Claims 6 and 19 have been canceled. *See* App. Br. 22–28 (Claims App'x). We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We affirm.

¹ According to Appellants, the real party in interest is Verizon Communications Inc. App. Br. 3.

STATEMENT OF THE CASE

Appellants' Invention

Appellants' invention generally relates to a router including a control module and a line card. Spec. ¶ 20. The control module may collect and maintain the routing information in a best routing information base (BRIB). *Id.* The line card may receive packets from a network and forward the packets to their destination based on routing information stored at a local just-in-time-forwarding information base (JIT-FIB). *Id.* The local JIT-FIB may include a portion of the BRIB and may act as a local cache of the BRIB at the line card. *Id.* Claims 1 and 9, which are illustrative, read as follows:

1. A device comprising:

a line card including a memory that stores a local routing table, configured to:

request a routing entry from a routing table,

receive the routing entry,

insert the routing entry in the local routing table, and

age out stale routing entries from the local routing table; and

a control module that includes:

the routing table; and

a domain name server (DNS) database that includes a list of DNS addresses, wherein the list of DNS addresses includes an Internet Protocol address of an authoritative DNS server, wherein the control module is configured to:

seed the local routing table with a routing entry corresponding to the IP address, in the DNS server database included in the control module, of the authoritative DNS server; and

distribute the routing entry in the routing table to the line card in response to the request from the line card,

wherein the DNS server database is not a routing table.

9. A router comprising:

a line card including a memory that stores a local routing table, configured to:

request a routing entry from a routing table,

receive the routing entry,

insert the routing entry in the local routing table, and

age out stale routing entries from the local routing table; and

a control module including the routing table, configured to:

distribute the routing entry in the routing table to the line card in response to the request from the line card,

wherein the line card is further configured to:

receive a first packet;

identify the first packet as a domain name system (DNS) request, and

wherein the control module is further configured to:

send a request to other routers to send copies of replies to the DNS request to the router,

wherein the local routing table includes one of a local forwarding information base (local FIB) or a local label forwarding information base (local LFIB), and

wherein the routing table includes a best routing information base (BRIB).

Rejections

Claims 1, 3, 4, 13, 20, and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski et al. (US 2010/0080233 A1; published Apr. 1, 2010) (“Kwapniewski”), Christian et al. (US 2009/0172192 A1; published July 2, 2009) (“Christian”), and Kadambi et al. (US 6,707,817 B1; issued Mar. 16, 2004) (“Kadambi”). Final Act. 4–9.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Christian, Kadambi, and Sun et al. (US 2011/0075680 A1; published Mar. 31, 2011) (“Sun”). Final Act. 9–10.

Claims 5 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Christian, Kadambi, and Goose et al. (US 2009/0274044 A1; published Nov. 5, 2009) (“Goose”). Final Act. 10–12.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Christian, Kadambi, and Samprathi (US 2009/0238179 A1; published Sept. 24, 2009). Final Act. 12–13.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Christian, Kadambi, and Joshi (US 2010/0061236 A1; published Mar. 11, 2010).² Final Act. 13–14.

² Although the heading of the rejection indicates the rejection is only based on Kwapniewski, Christian, and Joshi, the rejection states “as applied to claim 3 above, and further in view of JOSHI.” Final Act. 13. Claim 3, from which claim 8 depends, stands rejected based on Kwapniewski, Christian,

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Christian, Kadambi, and Ge et al. (US 2006/0083254 A1; published Apr. 20, 2006) (“Ge”).³ Final Act. 14.

Claims 9, 11, 12, 15, and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski and Morris (US 2010/0124220 A1; published May 20, 2010). Final Act. 15–21.

Claims 10 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Morris, and Janneteau et al. (US 2007/0253377 A1; published Nov. 1, 2007) (“Janneteau”). Final Act. 21–23.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kwapniewski, Morris, and Joshi. Final Act. 23–24.

Issues on Appeal

Did the Examiner err in finding that the combination of Kwapniewski, Christian, and Kadambi teaches or suggests “wherein the control module is configured to: seed the local routing table with a routing entry corresponding

and Kadambi. Final Act. 4. As such, we treat the omission of Kadambi from the heading of the rejection as a harmless typographical error and treat the rejection of claim 8 accordingly.

³ Although the heading of the rejection indicates the rejection is only based on Kwapniewski, Christian, and Ge, the rejection states “as applied to claim 3 above, and further in view of GE et al.” Final Act. 14. Claim 3, from which claim 14 depends, stands rejected based on Kwapniewski, Christian, and Kadambi. Final Act. 4. As such, we treat the omission of Kadambi from the heading of the rejection as a harmless typographical error and treat the rejection of claim 14 accordingly.

to the IP address, in the DNS server database included in the control module, of the authoritative DNS server . . . wherein the DNS server database is not a routing table,” as recited in claim 1?

Did the Examiner err in finding that the combination of Kwapniewski, Christian, Kadambi, and Samprathi teaches or suggests “wherein the line card is further configured to: prevent the routing entry corresponding to the IP address of the authoritative DNS server from being aged out of the local FIB,” as recited in claim 7?

Did the Examiner err in combining Kwapniewski, Christian, Kadambi, and Samprathi?

Did the Examiner err in finding that the combination of Kwapniewski and Morris teaches or suggests “wherein the control module is further configured to: send a request to other routers to send copies of replies to the DNS request to the router,” as recited in claim 9?

Did the Examiner err in combining Kwapniewski and Morris?

ANALYSIS

Claim 1

ISSUE 1

Did the Examiner err in finding that the combination of Kwapniewski, Christian, and Kadambi teaches or suggests “seed the local routing table with a routing entry corresponding to the IP address, in the DNS server database included in the control module, of the authoritative DNS server . . . wherein the DNS server database is not a routing table,” as recited in claim 1?

Regarding the disputed limitation, the Examiner finds Kwapniewski teaches each line card's forwarding table may be initialized as empty and initial packets are forwarded to a helper node. Final Act. 5 (citing Kwapniewski ¶¶ 36, 42, 48, 49). The Examiner finds because Kwapniewski teaches the forwarding table is initially empty and initial packets are forwarded to the helper node, Kwapniewski teaches or suggests "seed[ing] the local routing table with a routing entry corresponding to the IP address [of the helper node]." *Id.* The Examiner finds Christian describes a router storing a BGP table (e.g., a domain name server (DNS) database) that includes an IP address of an authoritative DNS server and the IP address. Final Act. 6 (citing Christian ¶¶ 24–26; Fig. 2). The Examiner finds Christian further teaches using BGP advertisements to seed the IP address to the router. *Id.* (citing Christian ¶¶ 23–27; Fig. 2). The Examiner finds Kadambi teaches separating entries in a routing table into two different tables. Final Act. 8 (citing Kadambi 24:1–26). Based on these findings, the Examiner concludes "it would have been obvious to the person of ordinary skill in the art at the time of the invention to implement the system and method as taught by KADAMBI to split up the routing table entries to different table for splitting up the routing table with DNS entries as in CHRSTIAN and the routing table as in KWAPIEWSKI to provide separate table for routing table and DNS table" so as to reduce the storage and provide a faster lookup. Final Act. 7–8.

Appellants contend the combination of Kwapniewski, Christian, and Kadambi fails to teach or suggest the disputed limitation because:

1. Kwapniewski teaches a line card of a router updates its forwarding table based on information stored in the router's routing table and updating a forwarding table, as taught by

Kwapniewski, does not teach or suggest “seed the local routing table with a routing entry corresponding to the IP address,” as recited in claim 1 because claim 1 requires seeding a local routing table and Kwapniewski’s forwarding table is not a routing table. App. Br. 11 (citing Kwapniewski ¶¶ 36, 42, and 48–51).

2. Kwapniewski teaches that the information used to update the forwarding table is obtained from a routing table and not from a DNS server database that is not a routing table, as required by claim 1. App. Br. 12.
3. Kadambi teaches splitting a single address table into two tables and splitting a single address table into two separate tables, as taught by Kadambi, does not teach or suggest that a DNS server database is not a routing table because “[t]he tables of Kadambi ha[ve] absolutely nothing to do with the ‘DNS server database is not a routing table’ feature of claim 1.” App. Br. 12.

We do not find Appellants’ first contention persuasive. Kwapniewski teaches a processor in a router maintains a routing table that contains a representation of the network topology state information and stores the current information about the best known paths to destination networks. Kwapniewski ¶ 32. Kwapniewski teaches that a version of this routing table is maintained in all line cards so that lookups on incoming packets can be performed locally on each line card. *Id.* Kwapniewski further teaches that the version of the routing table maintained in all line cards “is what is referred to as the line card’s forwarding table.” Kwapniewski ¶ 32. Kwapniewski further teaches that for each route (e.g., a routing entry), the forwarding table may store “the outgoing port number, address of a next hop, and some statistics” (Kwapniewski ¶ 32), which is consistent with Appellants’ Specification’s description of “local JIT-FIB 512” (*see* Spec.

¶ 51–53; Fig. 5C) upon which Appellants rely for providing support for the claimed local routing table (App. Br. 4 (citing Spec. ¶ 27)).

We do not find Appellants’ second and third contentions persuasive because, as discussed *supra*, the Examiner does not rely on Kwapniewski and Christian for teaching or suggesting “wherein the DNS server database is not a routing table”; but rather relies on Kadambi for teaching or suggesting this limitation as Kadambi separates entries in the routing tables into two separate tables. Final Act. 7–8. Appellants’ contentions fail to address the combined teachings of the references and, therefore, are unpersuasive of error. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

For the foregoing reasons, we are not persuaded the Examiner erred in rejecting claim 1; and claims 3, 4, 13, 20, and 22, which depend from claim 1 and are not separately argued with particularity. *See* App. Br. 12–13.

Claims 2, 5, 8, 13, 14, and 21 depend from claim 1 and stand rejected under 35 U.S.C. § 103(a) based on Kwapniewski, Christian, Kadambi, and various additional references. Appellants do not argue these claims separately with particularity but, instead, rely on the arguments presented for claim 1. *See* App. Br. 13, 16–17. Accordingly, we are not persuaded the Examiner erred in rejecting claims 2, 5, 8, 13, 14, and 21 for the reasons discussed *supra* with respect to claim 1.

Claim 7

Issue 2: Did the Examiner err in finding that the combination of Kwapniewski, Christian, Kadambi, and Samprathi teaches or suggests “wherein the line card is further configured to: prevent the routing entry

corresponding to the IP address of the authoritative DNS server from being aged out of the local FIB,” as recited in claim 7?

Appellants contend the combination of Kwapniewski, Christian, Kadambi, and Samprathi fails to teach or suggest the disputed limitation. App. Br. 14–16; Reply Br. 4–5. In particular, Appellants contend:

Samprathi arguably teaches preventing the aging out of a destination MAC address from a control register. However, preventing a MAC address from being aged out from a control register does not disclose or suggest “preventing the routing entry corresponding to the IP address of the authoritative DNS server from being aged out of the local FIB” in conjunction with “age out stale routing entries from the local routing table,” as required by claim 7 and claim 1 [from which claim 7 depends]. That is, nothing in Samprathi discloses or suggests that the MAC address, which may be prevented by being aged out, can be construed to correspond to the IP address of the authoritative DNS server, as would be required by claim 7.

App. Br. 14–15 (citing Samprathi ¶ 30).

We do not find Appellants’ contention persuasive. As discussed *supra*, the Examiner finds the combination of Kwapniewski, Christian, and Kadambi teaches or suggests “seed[ing] the local routing table with a routing entry corresponding to the IP address, in the DNS server database included in the control module, of the authoritative DNS server.” *See* Final Act. 7–8; Ans. 4–5. The Examiner finds Samprathi teaches preventing a routing entry from being aged out of a routing table. Ans. 4–5 (citing Samprathi ¶ 30). Based on these findings, the Examiner concludes the combined teachings of Kwapniewski, Christian, Kadambi, and Samprathi teach or suggest “wherein the line card is further configured to: prevent the routing entry corresponding to the IP address of the authoritative DNS server from being aged out of the local FIB,” as recited in claim 7. *Id.*; *see also* Final Act. 12. Appellants are

also arguing limitations not found in the claim. Appellants assert “there is no rational basis for concluding ‘the authoritative DNS server is an important routing’ and that it would be obvious *for a router* to prevent an entry for an authoritative DNS server from being aged out of a routing table” (emphasis added). App. Br. 15. The claim does not require the router to prevent an entry from being aged out of a router table; rather the claim recites the line card is configured to prevent the routing entry from being aged out. Further, we agree with the Examiner that Samprathi’s paragraph 30, at a minimum, suggests preventing the routing entry from being aged out of the routing table is well known. Ans. 5. Appellants’ arguments are, therefore, unpersuasive of error.

For the foregoing reasons, we are not persuaded the Examiner erred in rejecting claim 7.

Claim 9

Issue 3: Did the Examiner err in finding the combination of Kwapniewski and Morris teaches or suggests “wherein the control module is further configured to: send a request to other routers to send copies of replies to the DNS request to the router,” as recited in claim 9?

Appellants contend the combination of Kwapniewski and Morris fails to teach or suggest the disputed limitation. App. Br. 17–18; Reply Br. 5–6. In particular, Appellants contend “Morris discloses that DNS nodes 410 and 412 are DNS servers” and “[e]ven if assuming for the sake of argument that the DNS servers do ‘route’ DNS requests, DNS servers are not routers,” therefore, Morris does not teach or suggest that a control module, including a routing table, sends a request to other routers to send copies of replies to

the DNS request to the router, as required by claim 9. App. Br. 17–18 (citing Morris, Fig. 4; ¶¶ 42, 43, 50, 51, 53, 70, and 73).

We do not find Appellants’ contentions persuasive. The Examiner finds Kwapniewski teaches a router having a control module. Final Act. 15 (citing Kwapniewski, Fig. 2; ¶ 31). The Examiner finds Morris teaches forwarding DNS requests among nodes 402, 404, 418 to the DNS servers, nodes 410, 412, 414, and 416. Ans. 5 (citing Morris, Fig. 4; ¶¶ 50, 51). The Examiner further finds Morris teaches “the sending node, path nodes, and other nodes are able to implement the detector and resolver for detecting and resolving [a] portion of the DNS requests and forward the requests to the DNS servers.” *Id.* at 5–6. Morris teaches execution environment 302, illustrated in Figure 3, includes a routing policy component 316 configured to determine routing information. Morris ¶ 60. Morris further teaches execution environment 302 can be provided by any of nodes 410, 412, 414, and 416 illustrated in Figure 4 (*id.*), Morris, therefore, teaches these nodes routing policy component 316 configured to determine routing information. As such, we are not persuaded the Examiner erred in finding Morris teaches or suggests the disputed limitation.

Issue 4: Did the Examiner err by combining Kwapniewski and Morris?

Appellants contend the combination of Kwapniewski and Morris is improper because the Examiner “has not provided a valid reason for combining Kwapniewski and Morris.” App. Br. 18. Appellants assert the Examiner finds the motivation for combining the teachings of the applied references is “to resolve the DNS request faster.” App. Br. 18 (citing Final Act. 17) (emphasis omitted). Appellants argue “[c]ombining Kwapniewski

and Morris does not yield a routing scheme that should resolve a domain name any faster” and “[i]f there is a rational reason as to why the combination would resolve domain names any faster, the Examiner has not provided such a rationale.” *Id.*

We do not find Appellants’ contention persuasive. As noted *supra*, a motivation to combine can be found in “any need or problem known in the field of endeavor at the time of the invention and addressed by the patent.” *KSR*, 550 U.S. at 420. “[T]he analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 418. Here, the Examiner finds “it would have been obvious to the person of ordinary skill in the art at the time of the invention to implement the system and method as taught by MORRIS in the system of KWAPIEWSKI [sic] for the line card to identify the packet and the processor to send the request” and “[t]he motivation would have been to resolve the DNS request faster.” Final Act. 16–17. Because Morris teaches the methods are for incrementally resolving a host name to a network address as opposed to end-to-end name resolution (Morris ¶¶ 2–3), we find the Examiner’s proffered motivation to be reasonable. Appellants do not present evidence that the resulting arrangement was “uniquely challenging or difficult for one of ordinary skill in the art” or “represented an unobvious step over the prior art.” *See Leapfrog*, 485 F.3d at 1162. As such, we are not persuaded the Examiner erred in combining Kwapniewski and Morris.

For the foregoing reasons, we are not persuaded the Examiner erred in rejecting claim 9; and claims 11 and 12, which depend from claim 9 and are not separately argued with particularity. *See* App. Br. 19.

Claim 10 depends from claim 9 and stands rejected under 35 U.S.C. § 103(a) based on the combination of Kwapniewski, Morris, and Janneteau. Appellants do not argue claim 10 separately with particularity but, instead, rely on the arguments presented for claim 9. *See* App. Br. 19. Accordingly, we are not persuaded the Examiner erred in rejecting claim 10 for the reasons discussed *supra* with respect to claim 9.

DECISION

We affirm the Examiner's rejections of claims 1–5, 7–18, and 20–22 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED